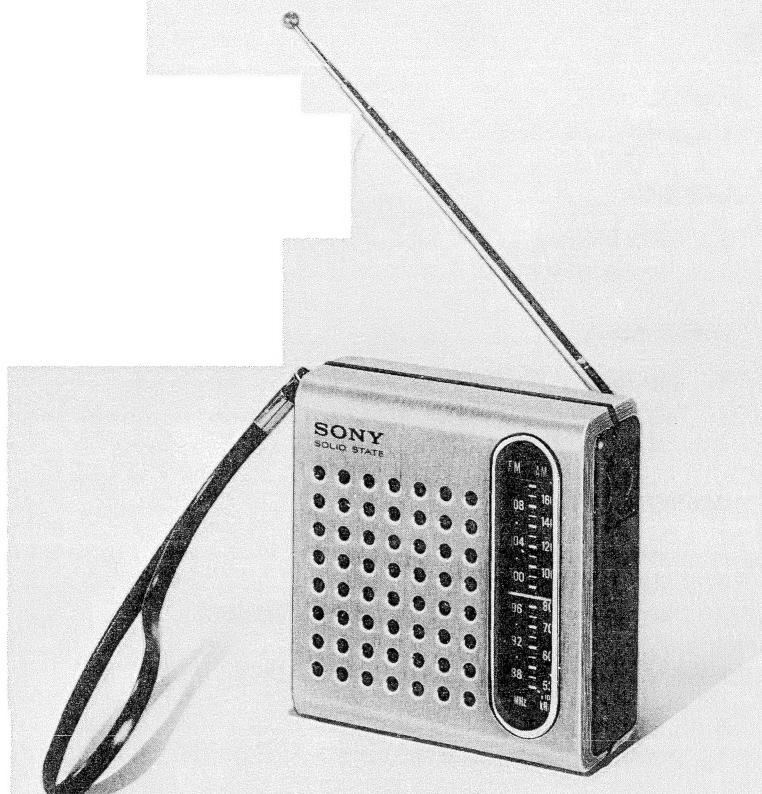


# TFM-3750W

USA Model



## FM/AM PORTABLE RADIO

### SPECIFICATIONS

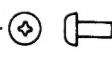
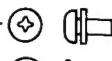
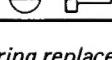
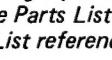
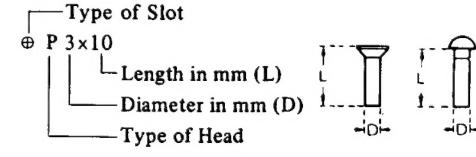
Circuit:	9-transistor, 5-diode 2-band superheterodyne	Maximum Power Output:	320 mW
Frequency Ranges:	FM 87.5 ~ 108 MHz (3.43 ~ 2.78 m) AM 530 ~ 1,605 kHz (566 ~ 187 m)	Current Drain at No Signal:	FM 17 mA AM 14 mA
Intermediate Frequencies:	FM 10.7 MHz AM 455 kHz	Speaker:	2 1/4" (57.2 mm) dia PM dynamic, 8 $\Omega$
Antennas:	FM built-in telescopic antenna AM built-in ferrite bar antenna	Power Requirements:	9 V DC battery JIS 006P or EVEREADY 216 or RAY-O-VAC 1604 or equivalent
Sensitivity:	FM 5 $\mu$ V (14 dB) at S/N = 30 dB AM 100 $\mu$ V/m (40 dB/m)	Dimensions:	3 7/8" (W) x 3 7/8" (H) x 1 7/8" (D) 100 mm (W) x 100 mm (H) x 48.3 mm (D)
Selectivity:	20 dB at $\pm$ 10 kHz off-resonance at 1,000 kHz	Weight:	11.6 oz (330 g) with battery

**SONY**  
®  
**SERVICE MANUAL**

**TABLE OF CONTENTS**

<u>Section</u>	<u>Title</u>	<u>Page</u>
Specifications	.....	1
Hardware Nomenclature	.....	2
<b>SECTION 1. OUTLINE</b>		
1-1. Block Diagram	.....	3
1-2. Internal View	.....	3
<b>SECTION 2. DISASSEMBLY</b>		
2-1. Rear Cover Ass'y Removal	.....	4
2-2. Printed Circuit board Removal	.....	4
2-3. Dial Cord Stringing	.....	4
<b>SECTION 3. ADJUSTMENTS</b>		
3-1. AM I-F Alignment	.....	5
3-2. FM I-F Alignment	.....	5
3-3. Frequency Coverage and Tracking Adjustment	.....	7
<b>SECTION 4. SCHEMATIC AND MOUNTING DIAGRAMS</b>		
4-1. Schematic Diagram	.....	9
4-2. Mounting Diagram -Conductor Side -	.....	11
<b>SECTION 5. EXPLODED VIEW AND PACKING</b>		
5-1. Exploded View	.....	13
5-2. Packing	.....	15
<b>SECTION 6. ELECTRICAL PARTS LIST</b>		

**— Hardware Nomenclature —**

<b>P</b> — Pan Head Screw .....		<b>SC</b> — Set Screw .....	
<b>PS</b> — Pan Head Screw with Spring Washer .....		<b>E</b> — Retaining Ring (E Washer) .....	
<b>K</b> — Flat Countersunk Head Screw .....		<b>W</b> — Washer	
<b>B</b> — Binding Head Screw .....		<b>SW</b> — Spring Washer	
<b>RK</b> — Oval Countersunk Head Screw .....		<b>LW</b> — Lock Washer	
<b>T</b> — Truss Head Screw .....		<b>N</b> — Nut	
<b>R</b> — Round Head Screw .....			
<b>F</b> — Flat Fillister Head Screw .....			
<b>— Example —</b>			
			

When ordering replacement parts, use **PART NUMBERS**  
listed in the Parts List or shown in **EXPLODED VIEW**.  
The Parts List reference numbers should not be used.

**Note:** All screws in this service manual are Phillips type (cross recess type) unless otherwise indicated.  
(-) : slotted head.

## SECTION 1 OUTLINE

### 1-1. BLOCK DIAGRAM

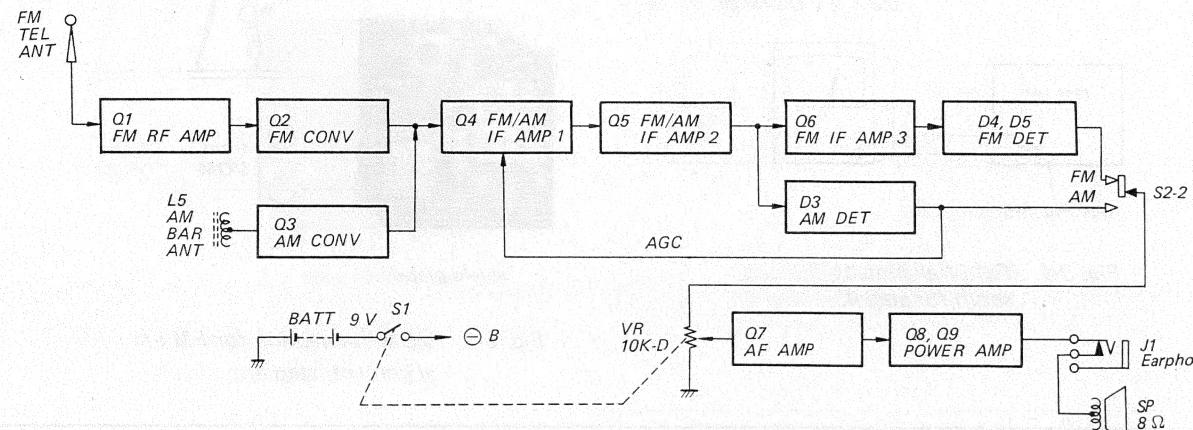


Fig. 1-1.

### 1-2. INTERNAL VIEW

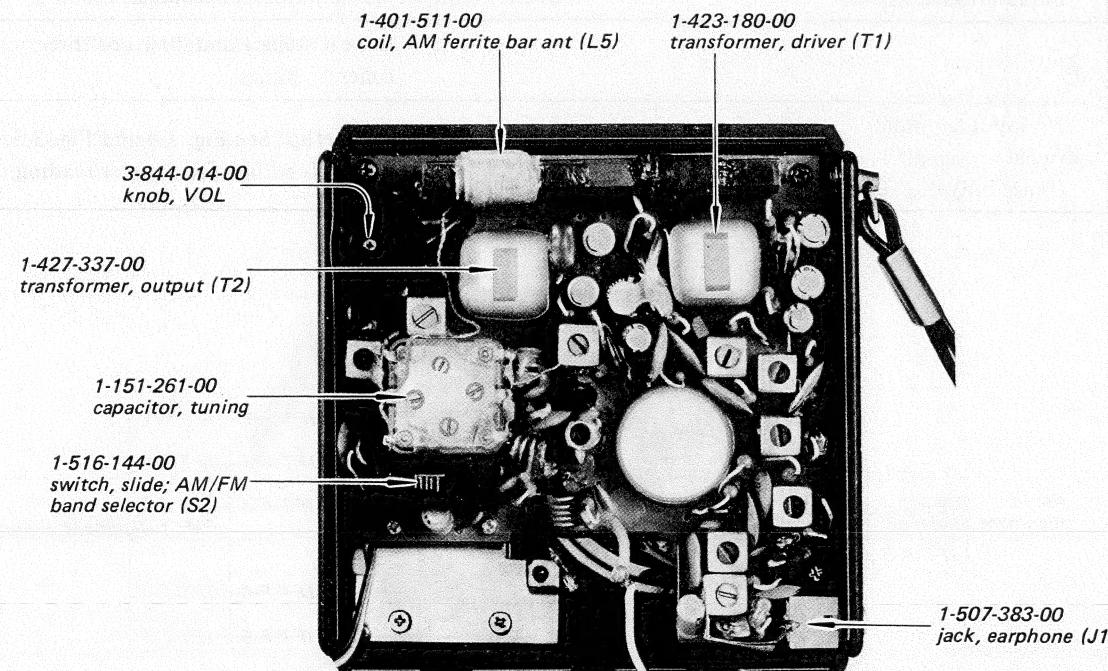


Fig. 1-2.

## SECTION 2 DISASSEMBLY

### 2-1. REAR COVER ASS'Y REMOVAL

1. Remove the rear cover ass'y, in numerical order as shown in Fig. 2-1.

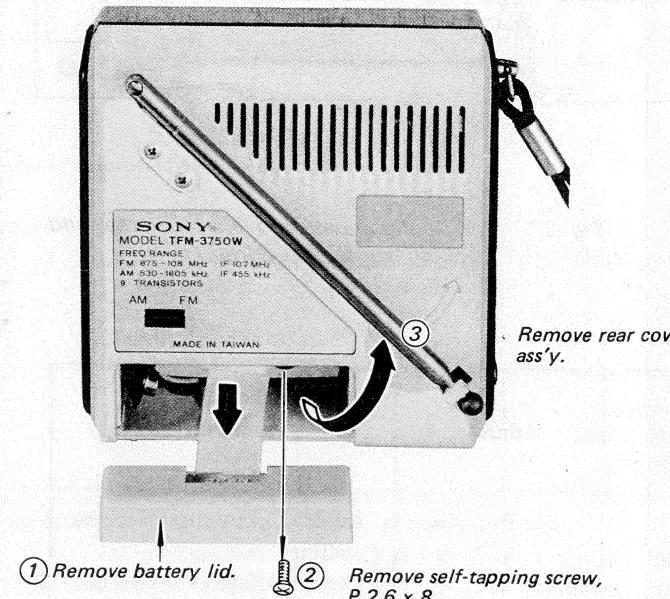


Fig. 2-1.

### 2-2. PRINTED CIRCUIT BOARD REMOVAL

1. Remove the rear cover ass'y as outlined in 2-1 above and follow the removing steps numerically as follows.

① Remove four self-tapping screws, P 2.5 x 8.

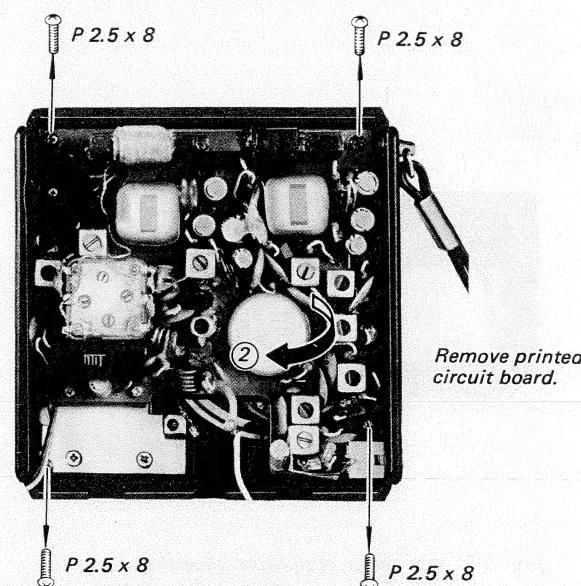


Fig. 2-2.

4. Set the dial scale back to the pulley shafts and the dial pointer to the dial cord as illustrated above.

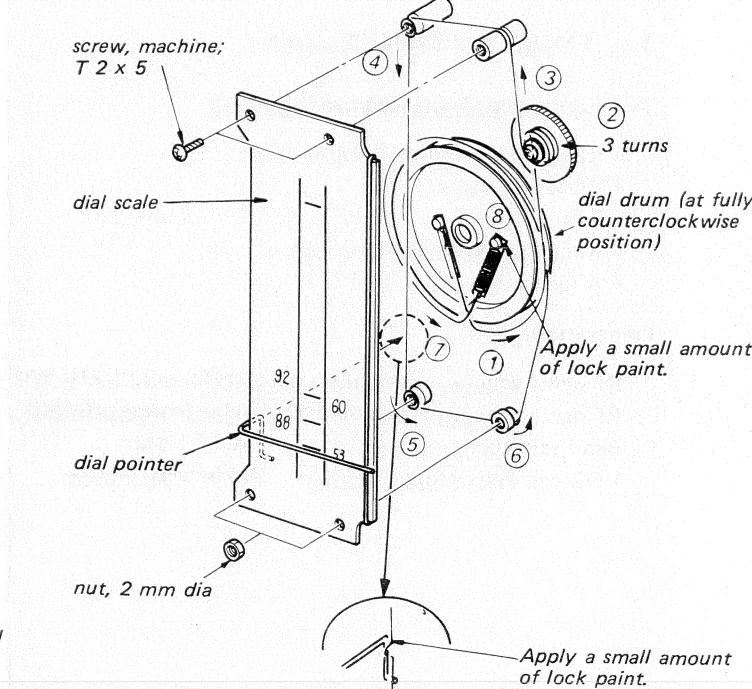


Fig. 2-4.

### 2-3. DIAL CORD STRINGING

1. Remove the dial scale and dial pointer by removing two machine screws, T2 x 5, and two nuts, 2 mm dia, as shown in Fig. 2-4 bellow.
2. Make dial cord ass'y as shown in Fig. 2-3 bellow.

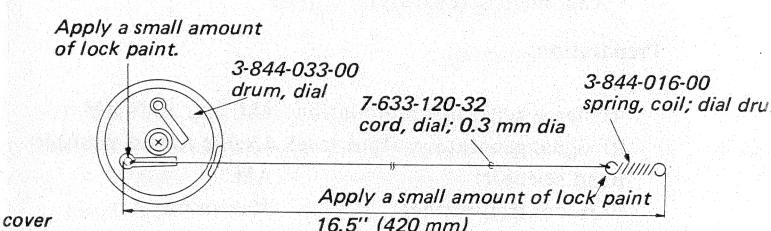
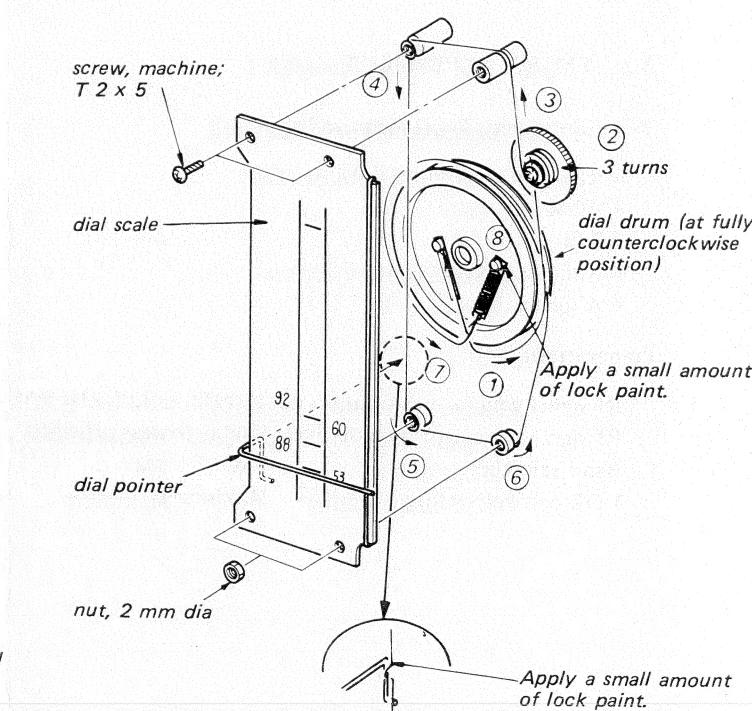


Fig. 2-3.

3. String the dial cord numerically as shown in Fig. 2-4 bellow.



### SECTION 3 ADJUSTMENTS

#### 3-1. AM I-F ALIGNMENT

##### Test Equipment/Tools Required

- \* Rf signal generator (AM)
- \* Loop antenna
- \* VOM
- \* 8 Ω
- \* Alignment screwdriver

##### Preparation:

Rf signal generator modulation: 400 Hz, 30 % AM

Rf signal generator output level: Usable lowest possible

Band selector: AM

VOL control setting: Maximum

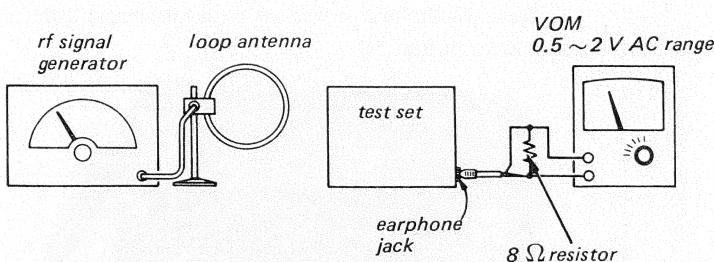


Fig. 3-1. AM i-f alignment, frequency coverage and tracking adjustment setup.

Rf Signal Generator Coupling	Rf Signal Generator Frequency	Receiver Dial Knob Setting	Adjust	Remarks
Loop antenna See Fig. 3-1.	455 kHz	No station, no beating position	See Fig. 3-6. 1. IFT A-1 2. IFT A-2 3. IFT A-3	Adjust for maximum meter reading. Repeat adjustment two or three times.

#### 3-2. FM I-F ALIGNMENT

##### Test Equipment/Tools Required

- \* Rf signal generator (FM)
- \* VOM
- \* 8 Ω
- \* Alignment screwdriver
- \* Alligator clip

##### Preparation:

Rf signal generator modulation: 400 Hz,  $\pm$  22.5 kHz FM

Rf signal generator output level: Usable lowest possible

Band selector: FM

VOL control setting: Maximum

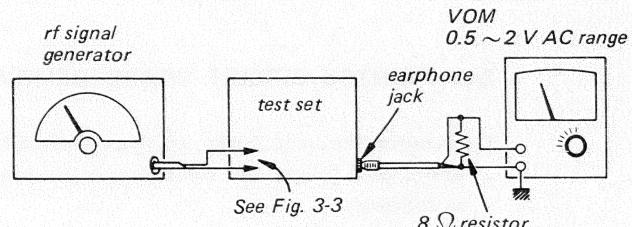


Fig. 3-2. FM i-f alignment frequency coverage and tracking adjustment setup

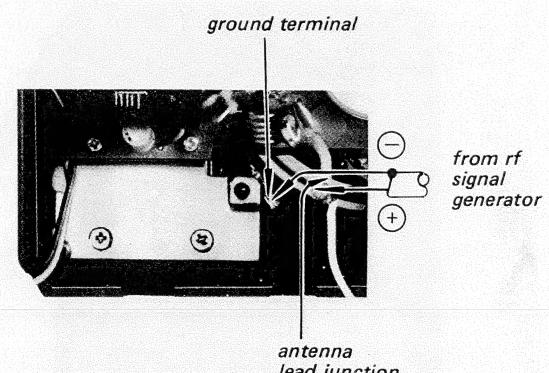


Fig. 3-3. Rf signal generator coupling for FM i-f alignment, frequency coverage and tracking adjustment.

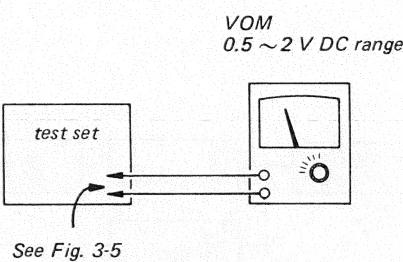


Fig. 3-4. FM i-f alignment setup for step 4.

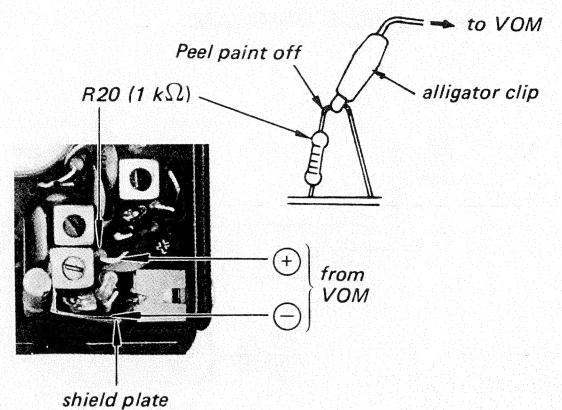


Fig. 3-5. VOM connection for FM i-f alignment, step 4.

Step	Rf Signal Generator Frequency	Receiver Dial Setting	Adjust	Procedure
1	10.7 MHz with FM modulation	No station, no beating position	Cores of IFT F-1 IFT F-2 IFT F-3 IFT F-4 IFT F-5 See Fig. 3-6	Test setup: See Fig. 3-2 and Fig. 3-3. Adjust for maximum meter reading.
2	10.7 MHz without modulation	— ditto —	Rf signal generator frequency	Carefully adjust rf signal generator frequency around 10.7 MHz for maximum meter reading.
3				Repeat steps 1 and 2 two or three times.
4	No input signal (noise only)	— ditto —	core of IFT F-5	Test setup: See Fig. 3-4 and Fig. 3-5. Adjust for "0V DC" meter reading.

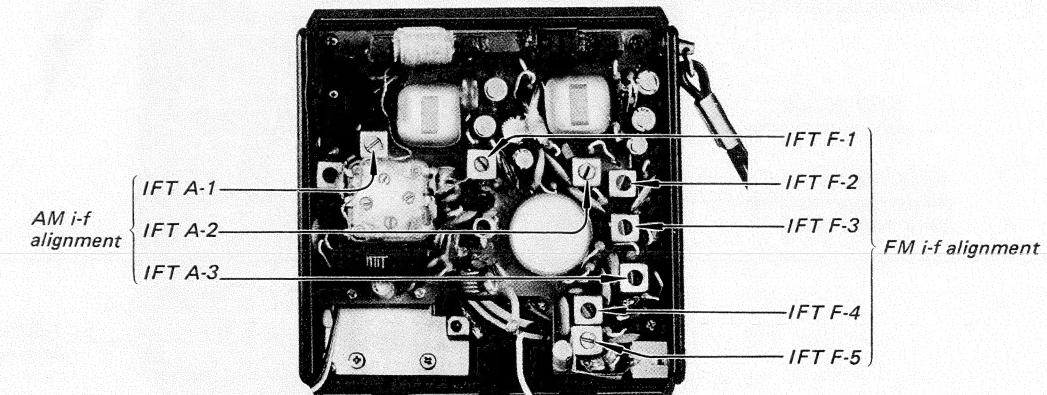
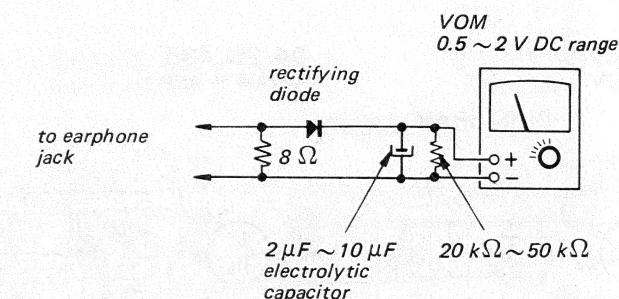
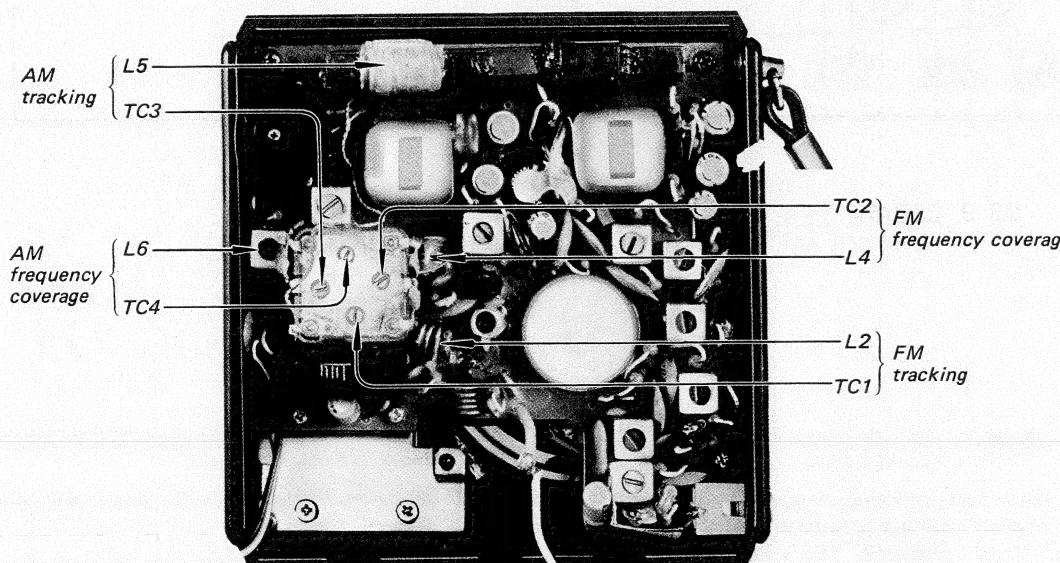


Fig. 3-6. Adjustment locations.

**3-3. FREQUENCY COVERAGE AND  
TRACKING ADJUSTMENT**

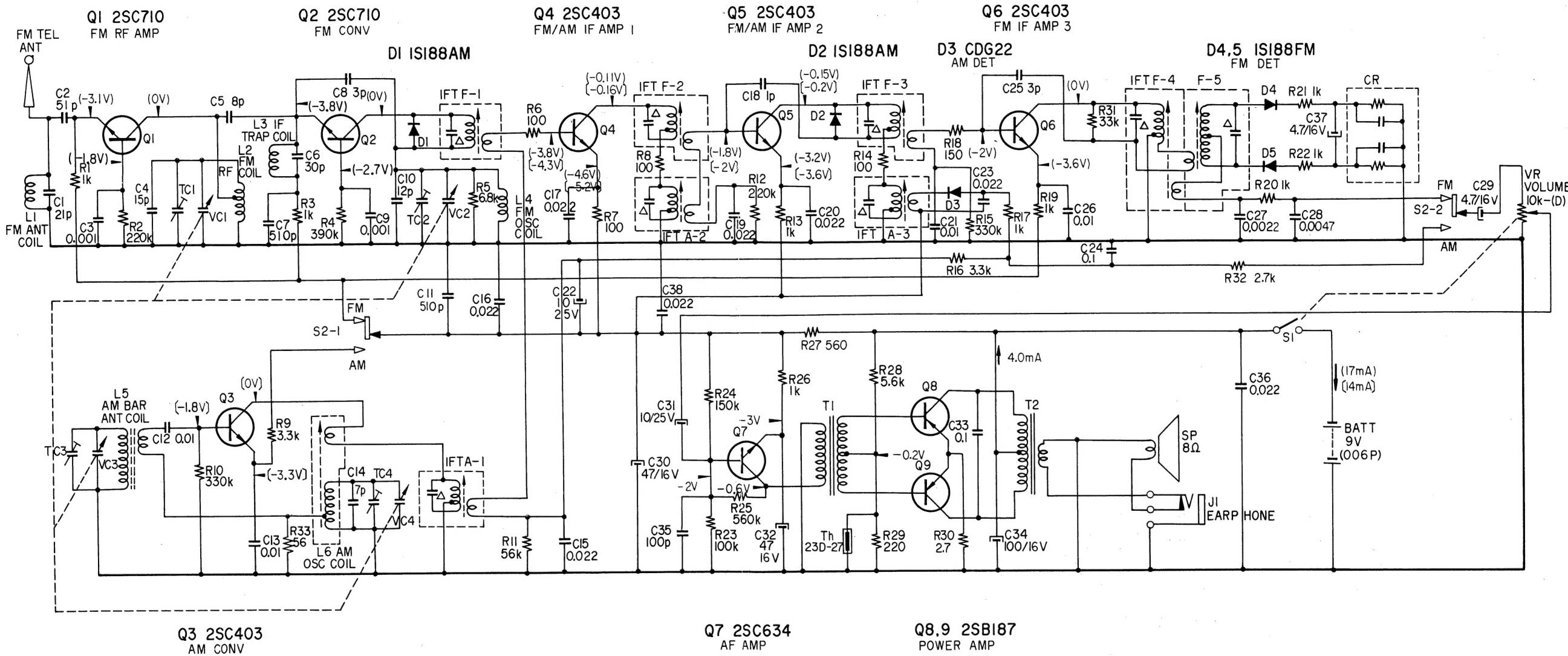
Adjustment	Rf Signal Generator Coupling	Rf Signal Generator Frequency	Receiver Dial Setting	Adjust	Remarks
AM Frequency Coverage	Loop antenna (See Fig. 3-1.)	520 kHz	Minimum frequency	Core of AM osc coil L6	Rf signal generator modulation: 400 Hz, 30 % AM Rf signal generator output level: Usable lowest possible. VOM connection: See Fig. 3-1. Band selector: AM VOL control setting: Maximum Adjust for maximum meter reading.
		1,700 kHz	Maximum frequency	AM osc trimmer TC4	
		620 kHz	Tune in 620 kHz signal	Position of AM ant coil L5	Repeat adjustment two or three times ending with TC4 and TC3. Fix L5 with wax.
			Tune in 1,400 kHz signal	AM ant trimmer TC3	
AM Tracking	Direct connection (See Fig. 3-2 and Fig. 3-3.)	86.5 MHz	Minimum frequency	Pitch of FM osc coil L4	Rf signal generator modulation: 400 Hz, $\pm$ 22.5 kHz FM Rf signal generator output level: Usable lowest possible. VOM connection: See Fig. 3-2. Band selector: FM VOL control setting: Maximum Adjust for maximum meter reading. Repeat adjustment two or three times ending with TC2 and TC1. Fix L2 with wax.
		109.5 MHz	Maximum frequency	FM osc trimmer TC2	
		86.5 MHz	Minimum frequency	Pitch of FM rf coil L2	
			Maximum frequency	FM rf trimmer TC1	

**Note:** When 0.5 ~ 2 V AC range is not available on the VOM, use a VTVM instead of the VOM or use a rectifying circuit with the VOM 0.5 ~ 2 V DC range as shown below.


**Fig. 3-8.**

**Fig. 3-7. Adjustment locations**

SECTION 4  
SCHEMATIC AND MOUNTING DIAGRAMS

## 4-1. SCHEMATIC DIAGRAM



Note: 1. All capacitance values in  $\mu$ F and all resistance values in  $\Omega$  unless otherwise noted.

2. All voltages measured with reference to battery positive terminal with a dc voltmeter (20 k $\Omega$ /V) with no signal received. The values in ( ) are measured with band selector set to FM and in [ ] with AM, others are

common. Variations may be noted due to normal production tolerances.

3. All currents measured with a dc ammeter with no signal received.

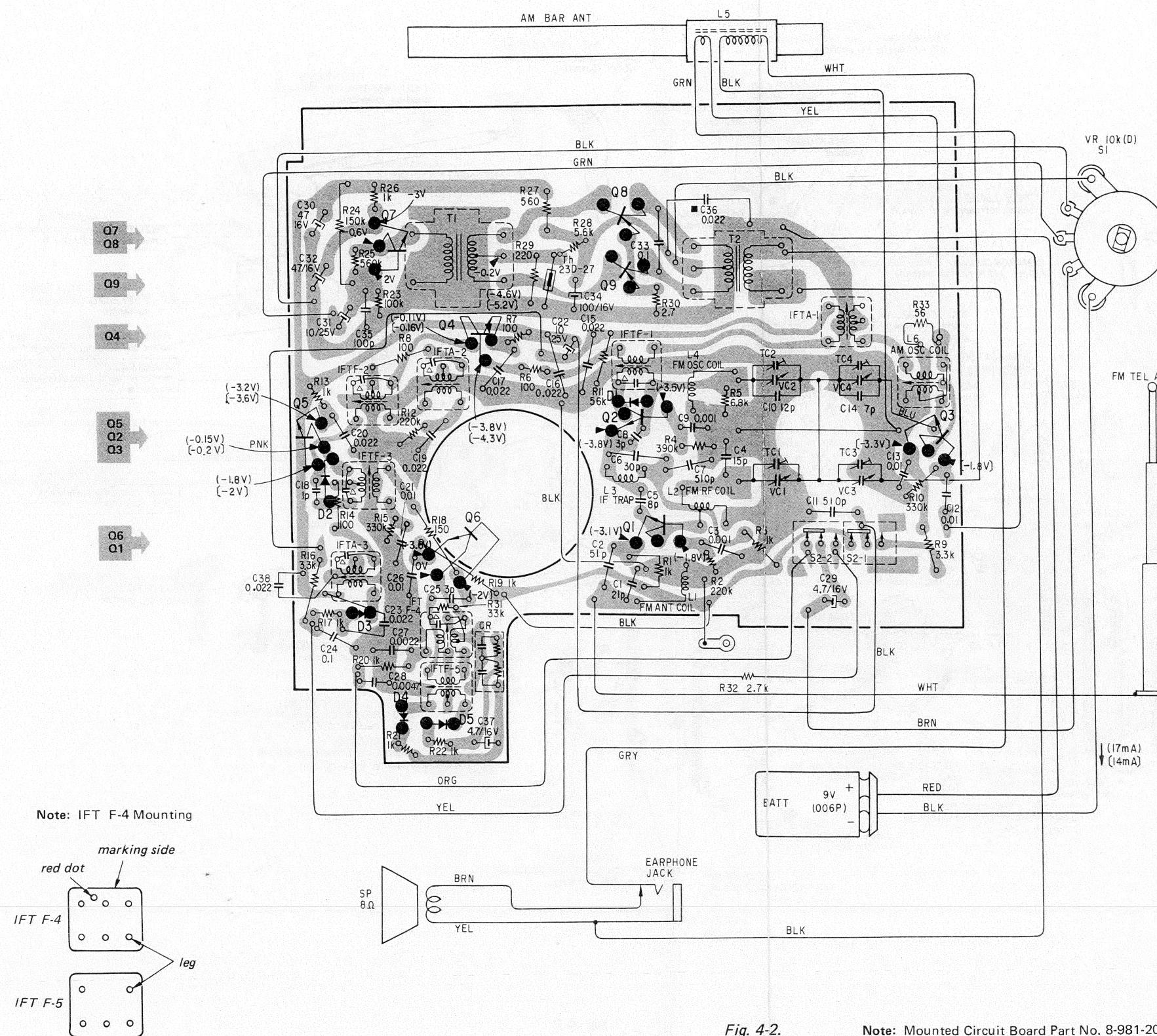
4. Capacitor marked with  $\Delta$  is built in i-f transformer.

# TFM-3750W TFM-3750W

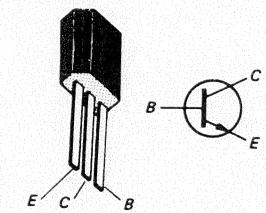
## 4-2. MOUNTING DIAGRAM

— Conductor Side —

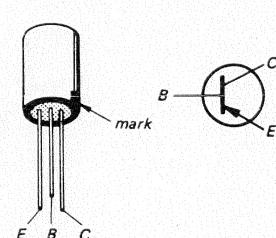
Q1, Q2 : 2SC710



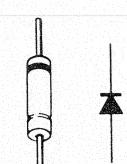
Q3 thru Q6 : 2SC403  
Q7 : 2SC634



Q8, Q9 : 2SB187



D1, D2 : 1S188 AM  
D3 : CDG-22  
D4, D5 : 1S188 FM



SECTION 5  
EXPLODED VIEW AND PACKING

5-1. EXPLODED VIEW

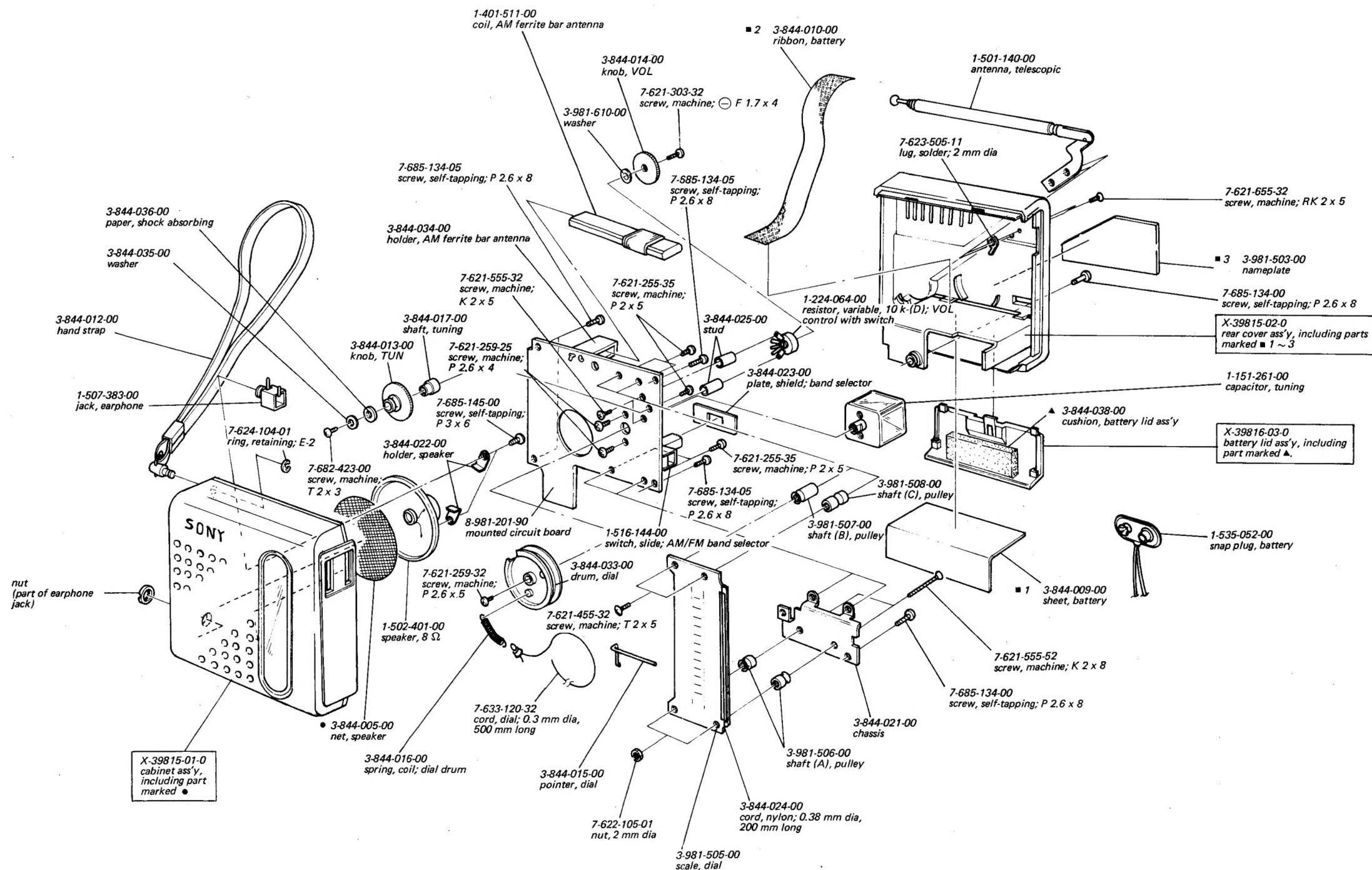
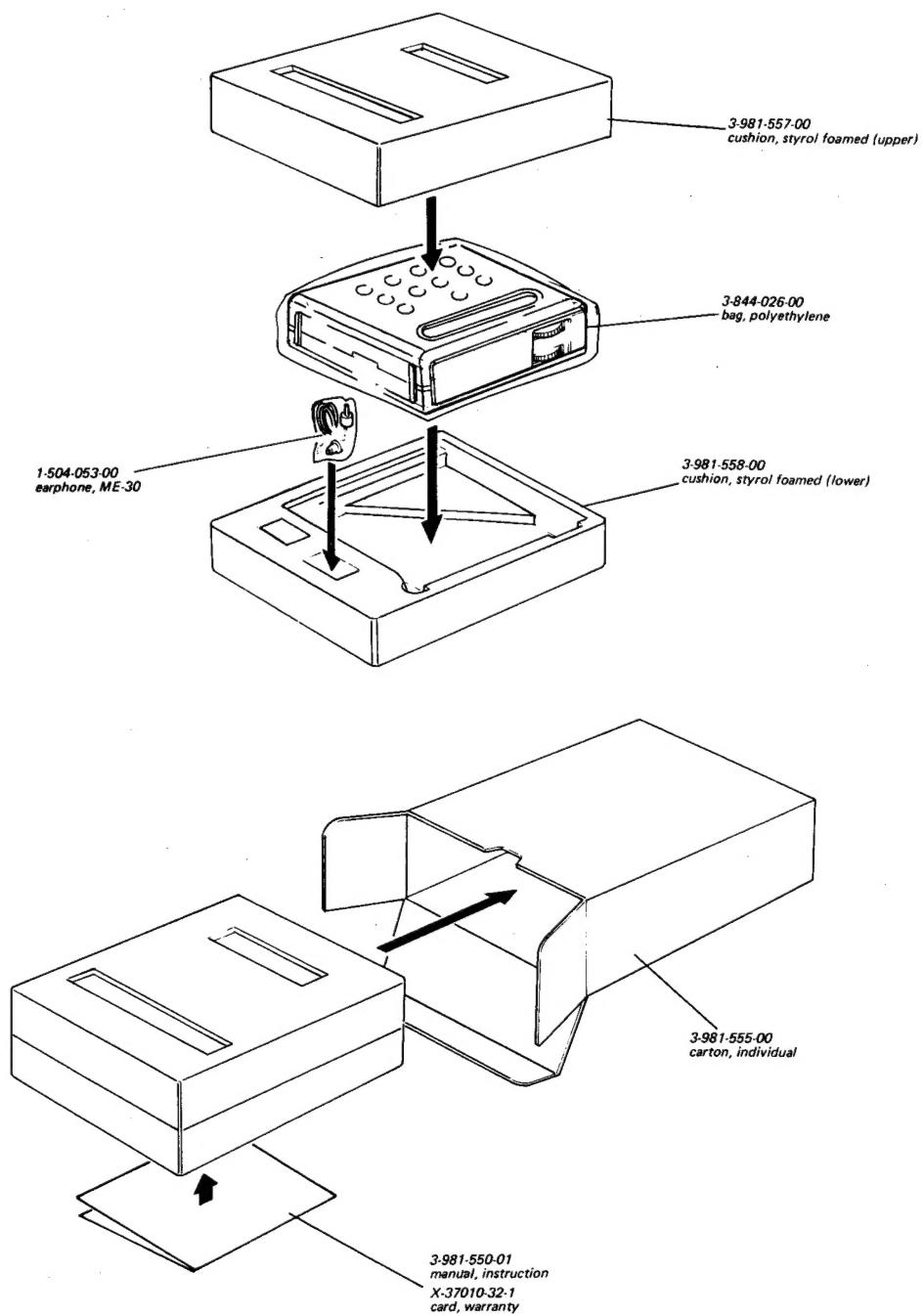


Fig. 5-1.

**5-2. PACKING****Fig. 5-2.**

## SECTION 6

### ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
<b>MOUNTED CIRCUIT BOARD</b>					
	8-981-201-90	mounted circuit board	C6	1-102-962-11	30 p
<b>SEMICONDUCTORS</b>					
Q1		transistor 2SC710	C7	1-101-059-11	510 p
Q2		transistor 2SC710	C8	1-101-953-11	3 p
Q3		transistor 2SC403	C9	1-101-455-11	0.001
Q4		transistor 2SC403	C10	1-101-962-11	12 p
Q5		transistor 2SC403	C11	1-101-059-11	510 p
Q6		transistor 2SC403	C12	1-101-923-11	0.01
Q7		transistor 2SC634	C13	1-101-923-11	0.01
Q8		transistor 2SB187	C14	1-101-957-11	7 p
Q9		transistor 2SB187	C15	1-101-924-11	0.022
D1		diode 1S188AM	C16	1-101-924-11	0.022
D2		diode 1S188AM	C17	1-101-924-11	0.022
D3		diode CDG-22	C18	1-101-951-11	1 p
D4		diode 1S188FM	C19	1-101-924-11	0.022
D5		diode 1S188FM	C20	1-101-924-11	0.022
Th	1-800-213-00	thermistor 23D-27	C21	1-101-924-11	0.01
<b>COILS AND TRANSFORMERS</b>					
L1	1-405-530-00	coil, FM antenna	C22	1-121-398-11	10 25 V electrolytic
L2	1-405-548-00	coil, FM rf	C23	1-105-837-12	0.022 mylar
L3	1-405-544-00	coil, i-f trap	C24	1-105-685-12	0.1 mylar
L4	1-405-536-00	coil, FM oscillator	C25	1-101-953-11	3 p
L5	1-401-511-00	coil, AM ferrite bar antenna	C26	1-101-923-11	0.01
L6	1-405-526-00	coil, AM oscillator	C27	1-102-100-11	0.0022
IFT A-1	1-403-879-00	transformer, AM i-f	C28	1-102-102-11	0.0047
IFT A-2	1-403-878-00	transformer, AM i-f	C29	1-121-394-11	4.7 16 V electrolytic
IFT A-3	1-403-877-00	transformer, AM i-f	C30	1-121-409-11	47 16 V electrolytic
IFT F-1	1-403-880-00	transformer, FM i-f	C31	1-121-398-11	10 25 V electrolytic
IFT F-2	1-403-881-00	transformer, FM i-f	C32	1-121-409-11	47 16 V electrolytic
IFT F-3	1-403-881-00	transformer, FM i-f	C33	1-105-685-12	0.1 mylar
IFT F-4	1-403-882-00	transformer, FM i-f	C34	1-121-415-11	100 16 V electrolytic
IFT F-5	1-403-883-00	transformer, FM i-f	C35	1-101-963-11	100 p
T1	1-423-180-00	transformer, driver	C36	1-101-924-11	0.022
T2	1-427-337-00	transformer, output	C37	1-121-394-11	4.7 16 V electrolytic
<b>CAPACITORS</b>					
All fixed capacitors are ceramic type expressed in $\mu$ F except as indicated with p, which means $\mu\mu$ F.					
C1	1-102-958-11	21 p	R1	1-242-673-11	1 k
C2	1-101-882-11	51 p	R2	1-242-729-11	220 k
C3	1-101-455-11	0.001	R3	1-242-673-11	1 k
C4	1-102-956-11	15 p	R4	1-242-735-11	390 k
C5	1-102-810-11	8 p	R5	1-242-693-11	6.8 k
			R6	1-242-649-11	100
			R7	1-242-649-11	100
			R8	1-242-649-11	100
			R9	1-242-685-11	3.3 k
			R10	1-242-733-11	330 k

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R11	1-242-715-11	56 k
R12	1-242-729-11	220 k
R13	1-242-673-11	1 k
R14	1-242-649-11	100
R15	1-242-733-11	330 k
R16	1-242-685-11	3.3 k
R17	1-242-673-11	1 k
R18	1-242-653-11	150
R19	1-242-673-11	1 k
R20	1-242-673-11	1 k
R21	1-242-673-11	1 k
R22	1-242-673-11	1 k
R23	1-242-721-11	100 k
R24	1-242-725-11	150 k
R25	1-242-739-11	560 k
R26	1-242-673-11	1 k
R27	1-242-667-11	560

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R28	1-242-691-11	5.6 k
R29	1-242-657-11	220
R30	1-242-611-11	2.7
R31	1-242-709-11	33 k
R32	1-242-683-11	2.7 k
R33	1-202-343-11	56
VR	1-224-064-00	10 k-(D), variable; VOL control with switch

**MISCELLANEOUS**

TEL ANT	1-501-140-00	antenna, telescopic
SP	1-502-401-00	speaker, 8 $\Omega$
S2	1-516-144-00	switch, slide; AM/FM band selector
J1	1-507-383-00	jack, earphone
	1-535-052-00	snap plug, battery